WHAT IS CLAIMED IS:

1. A biologically pure culture of a *Saccharomyces cerevisae* strain which I) has the capability to maintain a totally floc mode characterized by yeast pellets of 0.1 to 5 mm diameter in a variety of fermentation media, ii) shows a yeast free cell (single or budding double cells) of less than 0.5 g/L with a yeast floc density as high as 100 g/L or higher, and iii) has a limiting osmo-tolerance for ethanol productivity of about 5.0 os/kg.

2. A biologically pure culture according to claim 1 which is that of *Saccharomyces cerevisae* BPSC-15.

3. A biologically pure culture according to claim 2 wherein the organism converts sugars to ethanol at a high rate due to the ability of the organism to maintain a high density of cells in a bio-reactor by virtue of the high settling rate of the flocs.

4. A method for producing ethanol 'beer' solution in a bio-reactor from a fermentation medium comprised of a fermentable carbohydrate, optional recycle stillage, and requisite nutrients, at a pH of between 3.0 and 8.0, a temperature between 5 and 45°C, and an effective amount of *Saccharomyces cerevisae* BPSC-15 of claim 2.

5. A method according to claim 4, wherein the fermentation is a batch process under agitation and optional aeration.

6. A method according to claim 4, wherein the fermentation is a consecutive batch mode method under agitation and optional aeration comprising decanting completed beer from a settled cell layer (formed upon completion of a fermentation and cessation of agitation and the optional aeration), immediate refilling of the bio-reactor with fresh fermentation media to allow successive batch fermentations, and repeating the foregoing.

7. A method according to claim 6, wherein the settled layer of BPSC-15 formed upon cessation of agitation and optional aeration is between 2 and 80% of the reactor liquid volume, and consecutive fermentations are completed in a period of time ranging from 0.5 to 36 hours.

8. A method according to claim 4, which is a continuous method comprising a number (2 to 8) of agitated and optionally aerated bio-reactors in series containing organism BPSC-15 wherein outflow of one bio-reactor is inflow of a following bio-reactor, fresh fermentation media is introduced continuously into a first bio-reactor, and completed beer recovered from overflow of a final bio-reactor of the series.

9. A method according to claim 8 wherein the average residence time of the fermentation medium (where average residence time is defined as total fermentation broth volume divided by the volume of feed per hour) in the series of bio-reactors is between 1 and 36 hours.

10. A method according to claim 4 which is a continuous method comprising introducing a suitable fermentation medium into a tower reactor (optionally agitated and/or aerated) in which the organism BPSC-15 has formed an active layer of 10 to 90% of reactor volume, and completed beer is withdrawn from the reactor.

11. A method according to claim 4 wherein the average residence time of fermentation medium in a tower reactor is between 1 and 36 hours.

12. A method according to claim 4 where the fermentation medium comprises recycled stillage at 5 to 80% volume, such method reducing the net effluent from the ethanol production process.

13. A method according to claim 4 where the fermentation medium comprises black strap cane or beet molasses without other nutrients and recycled stillage at 0 to 40% by volume.

14. A method according to claim 4 where the pH in the bio-reactor(s) is maintained at 3.5 to 4.0 via addition of ammonia or other suitable base with a beneficial result of limiting or eliminating problems with bacterial contamination.

15. A method according to claim 4 where a final fermented product is a potable beer, wine, or is distilled to other drinkable spirits.

16. A method according to claim 4 where the bio-reactor incorporates ethanol separation simultaneously with fermentation with a beneficial result of reducing solution osmolality contributed by the ethanol.